



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/730,747 | 12/08/2003 | Robert M. Koehl | 085455-9455-00 | 2653 |

23409 7590 06/20/2006

MICHAEL BEST & FRIEDRICH, LLP
100 E WISCONSIN AVENUE
MILWAUKEE, WI 53202

| |
|----------|
| EXAMINER |
|----------|

DWIVEDI, VIKANSHA S

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

3746

DATE MAILED: 06/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/730,747 | KOEHL, ROBERT M. | |
| | Examiner | Art Unit | |
| | Vikansha S. Dwivedi | 3746 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 3/17/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-35 and 87 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-35 and 87 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to the amendments of 3/17/2006. In making the below rejections and/or objections the examiner has considered and addressed each of the applicants arguments. Claims 20-35 and 87 are pending and are under current consideration.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 20-35 and 87 are rejected under 35 U.S.C. 102(b) as being anticipated by Struthers (U.S. Patent number 6,481,973).

Struthers discloses a method of operating a motor of a pump, the method comprising: measuring a bus current (Determined by the sensors 42, microprocessor 24 in conjunction with the control board 22)- note that the current is sensed (See Column 5 lines 18-30 and column 9 lines 30-45); being provided to the motor (12), (shown in Figure 2); determining whether the bus current is greater than a limp current limit setting. Note that any arbitrary current value can read on the limp current limit setting. Reducing at least one of an output voltage provided to the motor and an operating frequency of the motor if the bus current is greater than the limp current limit setting in order to drive the motor in a limp mode (Column 5, lines 18-30); and shutting down the

Art Unit: 3746

motor if the motor does not operate within operational limits while being driven in the limp mode (The control board (22) can shut the motor down if it does not operate within the desired range). Struthers explains that control board 22 can be equipped to monitor and record various operational data which may include supply voltage and operating current (Column 9, lines 22-38).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 20-35 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Markuson et al. (U.S. Patent number 4,767,280) in view of Struthers (U.S. Patent number 6,481,973).

Markuson et al. discloses a control system for pumps for controlling various system parameters and automatically controlling the pumping unit (Column 3, lines 33-37). It discloses an electric motor (2), a microprocessor (4) and a controller (10), figure 1 shows the components of the control system. The microprocessor (4) utilizes a digital input to calculate limp mode/underload conditions of the system (Column 4, lines 23-26). The controller (10) can control the motor (2) upon detection of various

Art Unit: 3746

predetermined conditions. The motor can be slowed down, shut down or restarted as needed (Column 6, lines 59-63). Figure 2 is an illustration of operating conditions being monitored by the controller. It shows the limp mode/underload (18, near 30) conditions with respect to the normal run as shown in Figure 2. Figure 2 also shows that the motor is turned off after running in limp mode/underload situation (See circa element number 30). Thus providing the teaching for finally shutting down the motor following limp mode. Markuson et al. does not disclose the reduction of the operating frequency of the motor nor the specific use of current and limp current limit setting—although he does teach measuring the power to the motor and thus a limp power limit setting as opposed to a specific limp current limit setting. As is consistent with the applicant's specification, the terms "limp mode" and "limp current limit" are interpreted to be a state of pump motor operation at reduced power or speed (reduced voltage and current to the motor), and the limit at which this state occurs, respectively. As is, if the sensed current, temperature, or voltage exceeds a predetermined limit value, (which constitutes a limp current, voltage, or temperature limit), the control circuit reduces speed of the motor by reducing power. The product of current and voltage equals power, it is obvious that the speed is reduced by reducing the power to the motor, i.e. reducing voltage or current. Struthers specifically teaches the control of the frequency (Column 5, lines 9-30) and using the current as the parameter to control the motor. It would have been obvious to use operating frequency as one of the controlling parameter as it is easy to calculate and monitor and is accurate. It would have been obvious to one of ordinary skill in the

art to employ the current and a limp current limit setting as a well known component of limp power, in order to control the motor using a known equivalent in the art.

Claims 20-35 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Struthers (U.S. Patent number 6,481,973) in view of Markuson et al. (U.S. Patent number 4,767,280)

Struthers teaches the invention substantially as claimed by the applicant by disclosing a AC motor with a microcontroller that controls the unit on the basis of the sensor data provided to the controller. The controller also monitors the operating conditions and generates alarm/signal or corrective feedback as appropriate. Struthers teaches one of ordinary skill in the art to employ a limp mode and shut down mode. As applied above, any arbitrary value can be considered the limp current limit setting but Struthers does not specifically indicate at what value the limp current limit setting should be. Markuson et al. clarifies the idea in figure 2 and illustrates how the operating conditions are monitored by the controller to place the motor in a limp mode at less than 10% of the normal operating condition. It shows the limp mode/underload (18) conditions with respect to the normal run as shown in Figure 2. Figure 2 also shows that the motor is turned off after running in limp mode/underload situation. As is consistent with the applicant's specification, the terms "limp mode" and "limp current limit" are interpreted to be a state of pump motor operation at reduced power or speed (reduced voltage and current to the motor), and the limit at which this state occurs, respectively. As is, if the sensed current, temperature, or voltage exceeds a predetermined limit value, (which

Art Unit: 3746

constitutes a limp current, voltage, or temperature limit), the control circuit reduces speed of the motor by reducing power. The product of current and voltage equals power, it is obvious that the speed is reduced by reducing the power to the motor, i.e. reducing voltage or current. It would have been obvious to modify Struthers as taught by Markuson et al. with a specified value for a limp mode to operate the system more efficiently.

Response to Arguments

The rejections based on Lifson et al. (U.S. patent number 6,925,823) have been replaced with new rejections in view of the applicants declaration submitted to establish the conception and reduction to practice of the invention in the United States before October 28, 2003 (the filing date of Lifson et al.)

Since new grounds of rejection have been made, this office action is being made non-final to afford the applicant the opportunity to respond to the new grounds of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vikansha S. Dwivedi whose telephone number is 571-272-7834. The examiner can normally be reached on M-F, 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy S. Thorpe can be reached on 571-272-4444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

VSD


TAE JUN KIM
PRIMARY EXAMINER